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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,446	01/02/2002	Toshitsugu Yamamoto	009683-392	8139

7590 02/09/2006

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EXAMINER

THOMPSON, JAMES A

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/032,446	<b>Applicant(s)</b> YAMAMOTO, TOSHITSUGU	
	<b>Examiner</b> James A. Thompson	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2002 and 01 April 2002.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                             |                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                             | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/1/02</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

2. The information disclosure statement filed 01 April 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. In particular, there is no copy of "An Adaptive Algorithm for Spatial Grayscale" by Robert W. Floyd in the case file.

### *Specification*

3. The disclosure is objected to because of the following informalities: On page 6, line 5, "Fig. 14" should be changed to "Fig. 15" in order to reference the proper figure.

Furthermore, while Examiner has fully considered the present specification, Applicant is nevertheless advised to inspect the present specification to ensure technical and grammatical accuracy.

Appropriate correction is required.

### *Drawings*

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4. Figures 15-22 should be designated by a legend such as -- Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because the flow chart steps "S101" and "S103" are different in figure 2 and figure 12. Furthermore, in figure 13, there are no labels which properly label the steps shown in the flowchart illustrated therein. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin

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as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the threshold value" in line 2. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "the threshold value" in line 4. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 101***

9. 35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claim 9 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 9, as presently recited, is simply software code on a recording medium. Claim 9 is not a part of a computer system which specifically executes the image processing program to perform specific action and produce specific outputs. While the purpose may be to "realize the method of image processing according to claim 8", there is nothing recited which specifies how the method of image processing according to claim 8, such as executing the image processing program with a computer. Furthermore, as presently recited in claim 9, realizing the method of image processing according to claim 8 is simply the intended use of the image processing program. There is no positive recitation of how the image processing program is specifically used. Claim 9 is not a process, machine, article of manufacture, or composition of matter, and is thus non-statutory subject matter.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international

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application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 6, 8 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishiguro (US Patent 6,501,566 B1).

**Regarding claims 1 and 10:** Ishiguro discloses an image processing apparatus (figures 1-5 and column 4, lines 8-19 of Ishiguro) comprising an input unit (figure 3(41) of Ishiguro) successively receiving, as inputs, image signals representing pixels (column 6, lines 23-27 and lines 40-41 of Ishiguro); a determining unit (figure 3(42); figure 4; column 6, lines 47-51; and column 6, line 64 to column 7, line 9 of Ishiguro) determining whether an input signal represents a white pixel (column 8, lines 46-53 of Ishiguro); and an error diffusion processing unit (figure 3(43-45) of Ishiguro) performing different processes depending on whether the input signal represents white pixel or not (figure 8 and column 8, lines 46-64 of Ishiguro). Input pixels are error corrected and placed into one of four possible locations (figure 8 and column 8, lines 41-48 of Ishiguro). Since the groupings are evenly distributed, a white pixel ( $D=0$ ) will necessarily be placed within the first group ( $D'=0\sim 41$ ) since the error to be distributed will not exceed +41. In figure 8 of Ishiguro, it can be seen that  $126-85=41$  (second group ( $D'=42\sim 126$ ));  $211-170=41$  (third group ( $D'=127\sim 211$ )); and the error for the fourth group ( $D'=212\sim 255$ ) will be negative. Thus, a white input pixel will necessarily be grouped in the first group and processed differently from pixels that are not white, specifically pixels that have values  $D'=42\sim 255$ .

Further regarding claim 10: The apparatus of claim 1 performs the method of claim 10.

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**Regarding claim 6:** Ishiguro discloses an image processing apparatus (figures 1-5 and column 4, lines 8-19 of Ishiguro) comprising an input unit (figure 3(41) of Ishiguro) successively receiving, as inputs, image signals representing pixels (column 6, lines 23-27 and lines 40-41 of Ishiguro); a determining unit (figure 3(42); figure 4; column 6, lines 47-51; and column 6, line 64 to column 7, line 9 of Ishiguro) determining whether an input signal represents a black pixel (column 8, lines 46-49 and lines 62-64 of Ishiguro); and an error diffusion processing unit (figure 3(43-45) of Ishiguro) performing different processes depending on whether the input signal represents black pixel or not (figure 8 and column 8, lines 46-64 of Ishiguro). Input pixels are error corrected and placed into one of four possible locations (figure 8 and column 8, lines 41-48 of Ishiguro). Since the groupings are evenly distributed, a black pixel ( $D=255$ ) will necessarily be placed within the fourth group ( $D'=212\sim 255$ ) since the error to be distributed will not be less than  $-43$ . In figure 8 of Ishiguro, it can be seen that the error for the first group ( $D'=0\sim 41$ ) will be positive;  $42-85=-43$  (second group ( $D'=42\sim 126$ )); and  $127-170=-43$  (third group ( $D'=127\sim 211$ )). Thus, a black input pixel will necessarily be grouped in the fourth group and processed differently from pixels that are not black, specifically pixels that have values  $D'=0\sim 212$ .

**Regarding claim 8:** Ishiguro discloses successively inputting image signals representing pixels (column 6, lines 23-27 and lines 40-41 of Ishiguro); determining whether an input signal represents a white or a black pixel or not (column 8, lines 46-53 and lines 62-64 of Ishiguro); and error diffusion process step performing different processes dependent on whether



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the input signal represents either white or black pixel or not (figure 8 and column 8, lines 46-64 of Ishiguro). Input pixels are error corrected and placed into one of four possible locations (figure 8 and column 8, lines 41-48 of Ishiguro). Since the groupings are evenly distributed, a white pixel ( $D=0$ ) will necessarily be placed within the first group ( $D'=0\sim41$ ) since the error to be distributed will not exceed  $+41$ . In figure 8 of Ishiguro, it can be seen that  $126-85=41$  (second group ( $D'=42\sim126$ ));  $211-170=41$  (third group ( $D'=127\sim211$ )); and the error for the fourth group ( $D'=212\sim255$ ) will be negative. Thus, a white input pixel will necessarily be grouped in the first group and processed differently from pixels that are not white, specifically pixels that have values  $D'=42\sim255$ . Furthermore, a black pixel ( $D=255$ ) will necessarily be placed within the fourth group ( $D'=212\sim255$ ) since the error to be distributed will not be less than  $-43$ . In figure 8 of Ishiguro, it can be seen that the error for the first group ( $D'=0\sim41$ ) will be positive;  $42-85=-43$  (second group ( $D'=42\sim126$ )); and  $127-170=-43$  (third group ( $D'=127\sim211$ )). Thus, a black input pixel will necessarily be grouped in the fourth group and processed differently from pixels that are not black, specifically pixels that have values  $D'=0\sim212$ .

### ***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 2-5, 7 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiguro (US Patent 6,501,566 B1) in view of obvious engineering design choice.

**Regarding claims 2 and 11:** Ishiguro discloses that said error diffusion processing unit outputs a signal representing a white pixel (figure 8 and column 8, lines 46-53 of Ishiguro) and calculates an error of zero and subsequent distribution of zero error to pixels (column 8, lines 51-53 of Ishiguro ( $D' - 0 = 0$  if  $D' = 0$ )), when the input signal represents a white pixel (figure 8 and column 8, lines 46-53 of Ishiguro).

Ishiguro does not disclose expressly that said error diffusion processing unit does not perform error calculation and subsequent distribution of error.

However, it would have been an obvious engineering design choice to simply not perform the error and error distribution calculations when the input pixel is white. Since the error for a white pixel is zero, and the subsequent error values to be distributed are zero, then eliminating the steps of error calculation and error distribution would be an obvious design modification to make since eliminating a superfluous step would increase the overall speed of image processing. An additional motivation to perform such an obvious engineering design choice would be to enhance a particular desired level (column 9, lines 27-35 of Ishiguro).

**Regarding claims 3 and 12:** Ishiguro discloses that said error diffusion processing unit performs error diffusion process using a threshold value smaller than a central value of possible

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values of said image signal (figure 8(T1) and column 8, lines 46-49 of Ishiguro).

**Regarding claims 4 and 13:** Ishiguro discloses that said error diffusion processing unit changes the threshold value in accordance with a magnitude of the signal input through said input unit (figure 8 and column 8, lines 46-59 of Ishiguro).

**Regarding claims 5 and 14:** Ishiguro discloses that said error diffusion processing unit performs a process of subtracting a prescribed value before distributing a calculated error (figure 5(#5); figure 8("Error E" column in table); and column 8, lines 50-64 of Ishiguro), and adding the prescribed value before performing thresholding (figure 3(41,D,R,D') and column 6, lines 64-67 of Ishiguro).

**Regarding claim 7:** Ishiguro discloses that said error diffusion processing unit outputs a signal representing a black pixel (figure 8 and column 8, lines 46-48 and lines 61-64 of Ishiguro) and calculates an error of zero and subsequent distribution of zero error to pixels (column 8, lines 61-64 of Ishiguro ( $D' - 255 = 0$  if  $D' = 255$ )), when the input signal represents a black pixel (figure 8 and column 8, lines 46-48 and lines 61-64 of Ishiguro).

Ishiguro does not disclose expressly that said error diffusion processing unit does not perform error calculation and subsequent distribution of error.

However, it would have been an obvious engineering design choice to simply not perform the error and error distribution calculations when the input pixel is black. Since the error for a black pixel is zero, and the subsequent error values to be distributed are zero, then eliminating the steps of error calculation and error distribution would be an obvious design

modification to make since eliminating a superfluous step would increase the overall speed of image processing. An additional motivation to perform such an obvious engineering design choice would be to enhance a particular desired level (column 9, lines 27-35 of Ishiguro).

15. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiguro (US Patent 6,501,566 B1) in view of Shimazaki (US Patent 5,696,846).

**Regarding claim 9:** Ishiguro discloses the method of image processing according to claim 8, as set forth in the arguments regarding claim 8, which are incorporated herein.

Since the method taught by Ishiguro is performed on digital image data, it would be reasonable to assume that the method is realized by an image processing program recorded on a recording medium. However, Ishiguro does not disclose expressly a recording medium recording an image processing program to realize said method.

Shimazaki discloses performing error diffusion using software executed by a computer (column 6, lines 16-18 of Shimazaki), and thus a recording medium recording an image processing program to realize an error diffusion method.

Ishiguro and Shimazaki are combinable because they are from the same field of endeavor, namely error diffusion processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically implement the method taught by Ishiguro using software executed by a computer, as taught by Shimazaki. The suggestion for doing so would have been that digital logic circuits are also capable of being realized through software on a computer-readable medium

that is executed by a computer. Therefore, it would have been obvious to combine Shimazaki with Ishiguro to obtain the invention as specified in claim 9.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



03 February 2006

James A. Thompson  
Examiner  
Art Unit 2624



THOMAS D. [illegible]  
[illegible]